

## How is the fetal circulation?

The fetal circulation is complex and has a distinctive characteristic: the presence of shunts (connections between the circulation of blood from the right and left chambers of the baby's heart).

## What is the aortic isthmus?

The aorta is the blood vessel that carries blood from the heart toward the body and brain. The aortic isthmus (Aoi) is an aortic segment that acts as a shunt.

## What is the importance of the Aoi?

The aortic isthmus, establishes a connection between the right and left ventricles, sending oxygenated blood to the upper and lower body in parallel, allowing the baby to increase or decrease the amount of blood that goes to the brain and heart, depending on the amount of oxygen provided by the placenta. Although the Aoi has an important role in the fetal circulation, it is not essential for its survival, since its absence (interruption of the aortic arch) is easily compensated by another shunt, the ductus arteriosus (DA), that provides oxygenated blood to the lower parts of the body and placenta. However, it is essential for postnatal life after the closure of the DA.

## How can the Aoi be assessed?

The Aoi can be assessed by a Doppler ultrasound. This test measures the blood flow in the baby's blood vessels. The Doppler ultrasound can be done simultaneously with an ordinary obstetrical ultrasound, is pain-free and is safe for both the mother and her baby.

## Why the Aoi can be important to assess for the baby?

In the management of a growth restricted unborn baby, an abnormal flow in a Aoi is a strong indication of deterioration of the baby's circulation. The diagnosis is very important in order to optimise the timing of delivery. As well, the Aoi can be used to predict some of the major congenital heart defect, such as coarctation of the aorta.

## What other questions should I ask?

- Should I repeat the Doppler ultrasound, and, if so, how often?
- Will my baby be born early?
- Where should I deliver?
- Where will the baby receive the best care after it is born?

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